

# NASA TECH BRIEF



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## Stabilizing Stainless Steel Components for Cryogenic Service

### The problem:

Stainless steel valve components commonly experience warpage or creep after being placed in service in cryogenic systems. The resultant dimensional changes can cause leakage of the cryogenic fluid.

### The solution:

The valve components are machined to a semifinish and then immersed (cold soaked) in a bath of the cryogenic liquid in which the components are to operate for approximately two hours. After this cold-soak treatment, the components are returned to ambient temperature and machine finished to the final drawing dimensions. By this procedure, the residual stresses and strains that would otherwise be produced in the metal during service are set up before the final machining step.

### Notes:

1. This procedure has been used by the Rocketdyne Division of North American Aviation, Inc., in the fabrication of stainless steel valve components for cryogenic systems for several years.
2. Inquiries concerning this procedure may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B67-10377

### Patent status:

No patent action is contemplated by NASA.

Source: C. F. Holden  
of North American Aviation, Inc.  
under contract to  
Marshall Space Flight Center  
(MFS-13127)

Category 05